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Applicant (Actual Inventor) ...

ANDREW AUGUSTINE MILLER.

Application and Provisional Specification  
No. 3504

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Application and Provisional Specification  
No. 5650

{ Lodged 21st January, 1927.  
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Complete Specification under Sec. 63A of  
"Patents Act 1903-1921"

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Complete Specification Accepted 29th July, 1927

Acceptance Advertised (Sec 50) 9 Aug., 1927.

Class 81.2.

Drawing attached.

### COMPLETE SPECIFICATION.

#### "Improvements relating to the construction of light walls and other parts of building structures."

I, ANDREW AUGUSTINE MILLER, of 202 Glenferrie Road, Glenferrie, in the State of Victoria, Commonwealth of Australia, Builder, hereby declare this invention, and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention refers to light wall and like structures comprising metal sheeting formed with steps for keying thereto plastic material applied thereto which are secured to studs to which also are secured wire mesh and other wire reinforcements to ensure the cement or lime mortar satisfactorily adhering.

With such construction the steps in the metal sheeting are continuous and arranged in parallel rows and the plastic material is applied as an exterior coating so that the metal sheeting is obscured.

One of the objects of this invention is to provide the metal sheeting with improved keying means such as beads or ledges that will more satisfactorily secure the plastic material and minimize cracking and ensure the wall being damp-proof.

Another object is to provide improved keying means that will permit plastic material being applied to both sides of the metal sheeting.

A further object is to provide the metal sheeting with improved keying means that will enable the plastic material to be applied to the inner surface of the metal sheeting which is thereby exposed.

Furthermore the structure may be utilized for flooring ceilings and roofing for which purposes the metal sheeting and reinforcements are affixed to joists or rafters.

The keying beads or ledges may be approximately dovetail shaped, under-cut or flared and of channel shape with flared sides and inturned edges so that the plastic material will key in the grooves behind the overhanging or projecting edges of the beads and also behind the inturned edges of the channel shaped beads or ledges.

When plastic material is applied to both sides of the metal sheeting the latter is formed with approximately dovetail or the like continuous keying grooves.

Furthermore the improved beads or ledges may be affixed to plain flat metal sheeting.

The invention also incorporates a means for ventilating hollow walls in which studs 5 form the bases of the structure.

Several examples of the invention are illustrated in the accompanying drawings whereof,

Figures 1, 2, 3, 4, 5 and 6, are sectional views illustrating various forms of the metal sheeting.

Figure 7 is a fragmentary horizontal section through a wall, and

Figure 8 a vertical section of same illustrating a wall with the metal sheeting on the outside.

Figure 9 is a perspective view illustrating the construction of wall before the plastic material is applied to the outside, and

Figure 10 is a vertical section (broken) of the wall illustrating the ventilating means.

Figures 11, 12 and 13 are fragmentary sectional views illustrating variations of construction when the metal sheeting illustrated in Figure 1 is used.

Figure 14 illustrates the invention as applied to a floor, and

Figure 15 as applied to a ceiling.

Figure 16 is a perspective view showing the wall scored to represent bricks.

Figure 17 is a horizontal section through a wall wherein metal studs are employed.

Figure 1 illustrates the kind of metal sheetings formed with a series of parallel continuous dovetail keying beads or ledges 1 with undercut grooves 3 behind their projecting edges 2.

When plastic material C such as cement mortar is applied to the side of the sheeting having the beads or ledges so as to cover the latter, it becomes keyed behind the edges in the grooves 3 and thus securely anchors the plastic material when dry and hard.

With this construction dovetail or undercut grooves 4 are formed at the back of said keying beads or ledges that will also key plastic material applied on the reverse side of the sheeting as in Figures 12 and 13.

In Figure 2, 5 designates another form of approximately dovetail keying bead or ledge and 6 and 7 in Figures 3 and 4 respectively other forms accomplishing the same object.

The keying bead or ledge 7 in Figure 4 is intended more particularly for light wall structures.

Figure 5 illustrates a dovetail shaped keying bead or ledge 8 that is rivetted on the face of a plain metal sheet S1 or the beads may be clipped to the face of the sheet by

means of tongues formed in the sheets. It will be evident, however, that beads of other cross section may be similarly secured to plain metal sheeting.

Figure 6 illustrates an attached bead or ledge of channel section 20 with flared sides 21 terminating in inturned edges 22 behind which the plastic material is keyed as well in the grooves 30 at the back of the flared sides.

Figures 7 and 8 show the metal sheeting S with keying beads or ledges such as 7 fixed by nails to studs 9 with reinforcing wire mesh 10 also similarly secured and intervening between the sheeting and said studs.

The cement mortar or other plastic material C is applied to the inner surface of the sheeting and so passes through the wire mesh 10 and becomes supported or keyed on the beads or ledges 7 and moreover by reason of the plastic material passing over the front at the studs and bearing against the sides thereof the material is additionally keyed.

Such a wall, when painted exteriorly provides an imitation wooden surface and if the plastic material is smoothed flat on the inside an inexpensive damp-proof wall useful for out buildings, garages and the like can be constructed.

In Figure 9 the wire mesh 10 is fixed to the studs 9 and additional reinforcement is provided by vertical wires 11 secured by staples and the metal sheeting is provided with the dovetail beads or ledges 1 and plastic material is applied to form an external coating.

It is preferred that at the corner or angles of the structure the edges 13 of the metal sheets adjacent the corner be separated a short distance as in Figure 9 as this construction ensures the plastic material being well keyed at the corner which may be finished with an arris or bull nose edge.

In the case where the metal sheeting forms the exposed surface as in walls or roofing the angles are preferably covered by boards 14 sheathed in metal sheeting 15 as in Figure 7.

Figure 11 illustrates the metal sheeting according to the example given in Figure 1 applied to the framing such as studs 9 joists or rafters without any reinforcing mesh and covered by plastic material only on the outer surface, and Figure 12 shows the same construction but with cement mortar applied to both the outer and inner surfaces of the metal sheeting, the inner

material being keyed in the dovetail grooves 4.

Figure 13 shows the same structure as in Figure 12 but with the addition of the reinforcing wire mesh 10 and the wires 11. Figure 14 illustrates the structure as applied to joists 16 of a floor and Figure 15 to act as a ceiling.

Figure 16 illustrates a wall constructed of sheeting with dovetail beads or ledges and reinforcements in which the cement mortar C has been colored a brick color and scored as at 17 in imitation of the mortar joints of brick work.

Similarly for roofing, the plastic material may be colored by impregnation or otherwise and scored to imitate tiles, shingles or the like or the plain cement mortar may be scored to represent stone work, or the surface may be rough cast, rusticated and quoins may be formed at the angles of walls.

The framings to which the sheeting is fixed may be lined with any desired material such as the metal sheeting described with a plastered surface, fibre sheets, lath and plaster or the like which is attached to the inner sides of the studs or other framing thus forming a cavity between the outer and inner coverings. Cavity walls of known kinds, in cases where studs are employed, do not have a free current of air through same between the studs as the latter are joined at their respective ends to top and bottom plates which close the top and bottom of the cavity.

According to this invention as in Figure 10, the bottom plate 19 is placed on its edge upon the outer one of a pair of slightly separated floor joists 24 and a strip of vermin proof or fly proof wire mesh 25 is tacked to the top of said pair of joists so that air can pass between same into the wall cavity. At the upper end of the studs are a pair of separated wall plates 26 placed on edge and the studs are notched on the sides at the upper and lower ends as in Figures 9 to receive said plate.

At the corner of walls as in Figure 16, it is preferred to provide two studs 9 in contact with each other though one of equal cross sectional area may be used.

By means of the construction described a permanent outlet is provided for the current of air that will pass up the cavities of the wall.

It is to be understood that the studs or other framing used in this construction to support the sheeting may be formed of metal of an approximately Z-shaped as in Figure

17 for instance and furthermore the metal sheeting may be of any thickness compatible with the strength required.

In the case where Z-shaped metal studs 31 are provided for walls having the metal sheeting S on each side of the studs and plastered with mortar C the sheets on opposite sides may be secured in position by transverse bolts 27 connecting said sheets.

It is to be understood that the metal sheeting with the improved keying beads or ledges and reinforcements and the mortar may be manufactured in sheets and fixed to the studs or other framing but it is preferred to build the whole structure in situ.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:—

1. In light wall and like structures, metal sheeting provided with a series of continuous keying beads or ledges approximately of dovetail shape for retaining plastic material applied to the surface of said sheeting. (Provisional Specification No. 5650/27.)

2. In light wall and like structures, metal sheeting provided on one side with a series of continuous keying beads or ledges of approximately dovetail shape and on the opposite side correspondingly shaped grooves for retaining plastic material applied to the surface of said sheeting. (Provisional Specification No. 5650/27.)

3. In light wall and like structures, metal sheeting as set forth in Claims 1 or 2, the construction whereby the approximately dovetail keying beads or ledges are fixed to plain metal sheeting. (Provisional Specification No. 5650/27.)

4. In light wall and like structures metal sheeting as set forth in Claim 1, the construction whereby the keying beads or ledges are fixed to plain metal sheeting and are channel shape with flared sides terminating with inturned edges. (Provisional Specification No. 5650/27.)

5. In light wall and like structures, metal sheeting constructed with keying beads or ledges as illustrated in Figures 2 or 3 of the drawings. (Provisional Specification No. 5650/27.)

6. In light wall and like structures, metal sheeting provided with a series of continuous keying beads or ledges substantially as illustrated on the inner side of the sheeting and fixed to framing, wire reinforcements fixed to said framing between same and the sheeting and plastic material applied to the metal structure to form a lining to the

sheeting. (Provisional Specification No. 3504/26.)

7. In light wall and like structures, metal sheeting provided with dovetail or like keying beads or ledges substantially as illustrated, secured to framing with plastic material applied to the sheeting to form an exterior coating. (Provisional Specification No. 5650/27.)

10 8. In light wall and like structures metal sheeting provided with dovetail or like keying beads or ledges as illustrated secured to framing, wire mesh with wire reinforcements fixed against said sheeting and plastic material applied to the metal structure to form an exterior coating. (Provisional Specification No. 5650/27.)

9. In light wall and like structures, metal sheeting provided on one side with dovetail or like keying beads substantially as illustrated and corresponding grooves on the opposite side with plastic material applied to both sides of the sheeting to form external and interior coatings. (Provisional Specification No. 5650/27.)

10. In light wall and like structures metal sheeting secured to framing and provided on the outer side with dovetail or like keying beads or ledges and on the inner side with dovetail keying grooves, wire mesh with wire reinforcements fixed against said sheeting and plastic material applied to the front and rear of said metal structure. (Provisional Specification No. 3504/26.)

11. In light wall or like structures, wherein metal sheeting with keying beads or ledges are fixed to opposite sides of metal

studs or the like, the arrangement wherein the sheetings are retained in position by bolts connecting the sheetings on opposite sides of the walls by means of transverse bolts. (Provisional Specification No. 5650/27.)

12. In light wall structures of the cavity type having an outer covering and an inner lining affixed respectively to the opposite sides of studs, the construction wherein the bottom plate of the wall is set on edge to permit entrance of air into the cavity and the studs are joined to two upper plates set on edge and separated and the bottom of the cavity is protected by vermin proof wire gauze. (Provisional Specification No. 5650/27.)

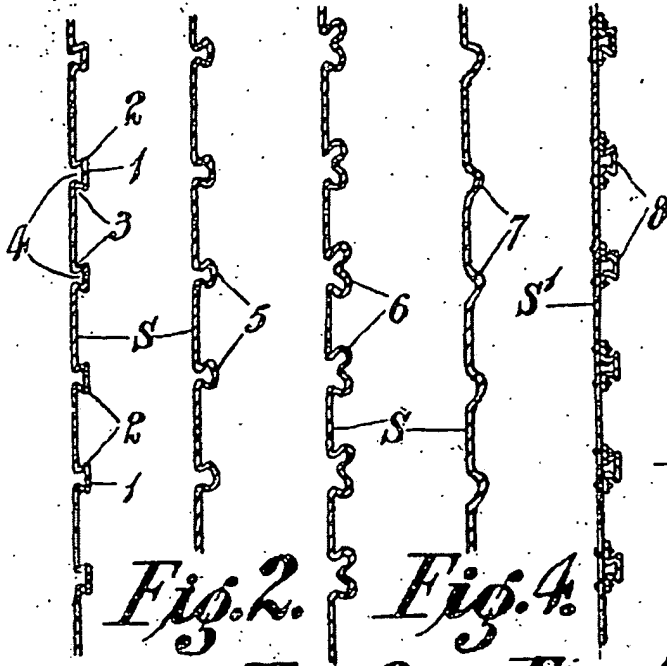
13. In light wall structures of the cavity type having studs to which is affixed an outer covering of sheet metal provided with keying beads and ledges and metal reinforcements to which plastic material is applied and a lining affixed to the inner sides of said studs, the arrangement by which the bottom plate of the wall is set on edge to permit entrance of air into the cavity and the studs are joined to two upper plates set on edge and separated and the bottom of the cavity is protected by vermin proof wire gauze. (Provisional Specification No. 5650/27.)

Dated this 15th day of February, 1927.

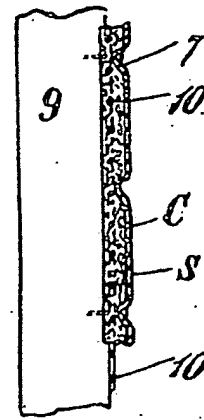
EDWD. WATERS & SONS,  
Patent Attorneys for

ANDREW AUGUSTINE MILLER.

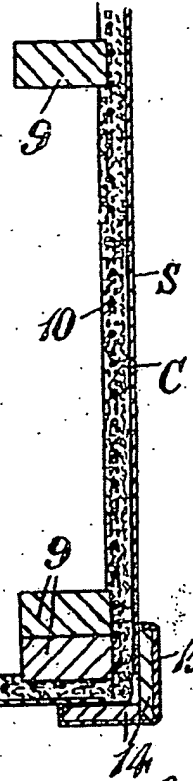
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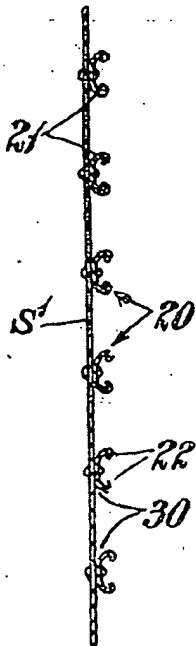
*Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.*



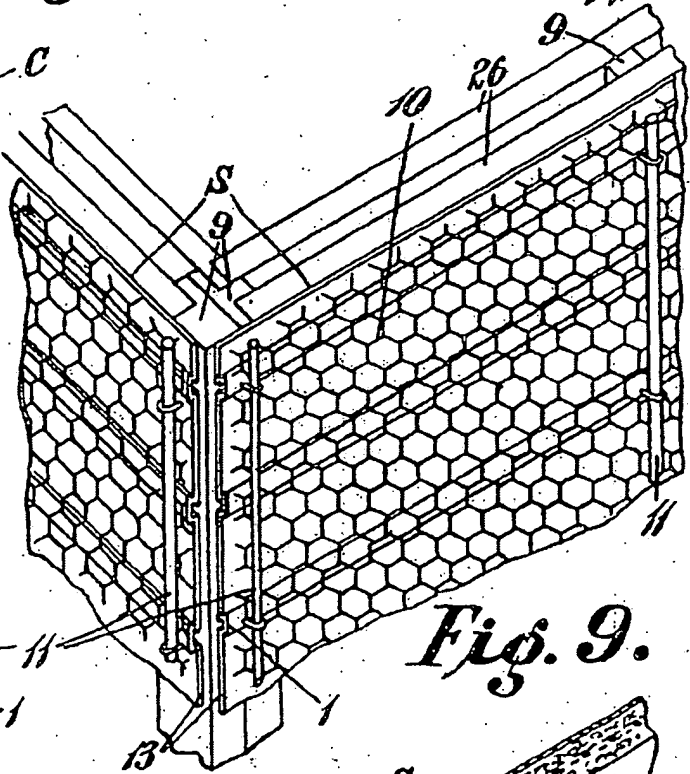
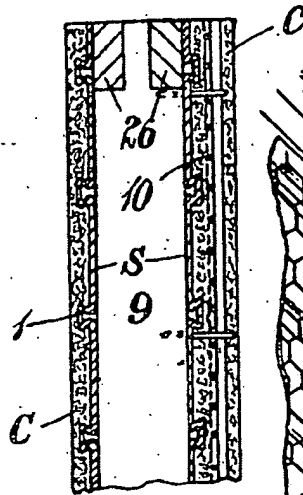
*Fig. 8.*



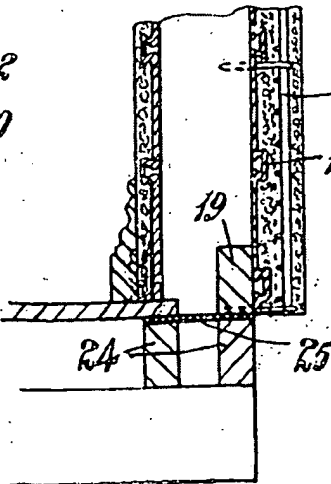
*Fig. 7.*



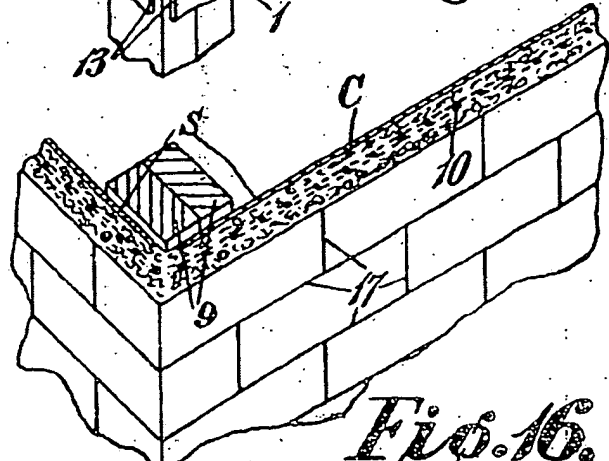
*Fig. 6.*



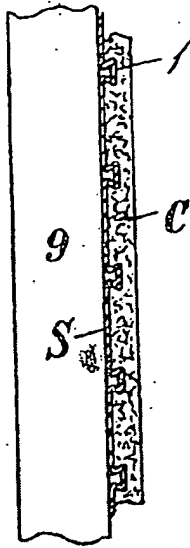
*Fig. 9.*



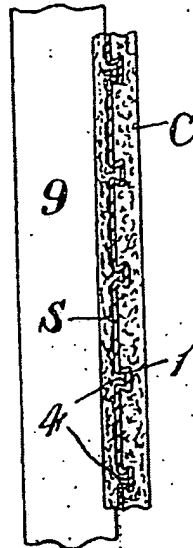
*Fig. 10.*



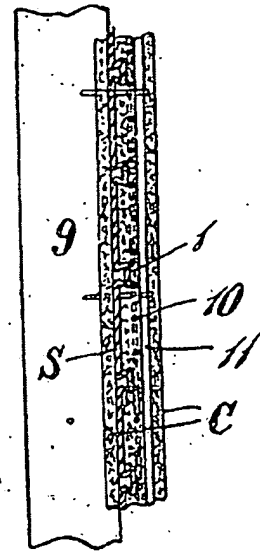
*Fig. 16.*



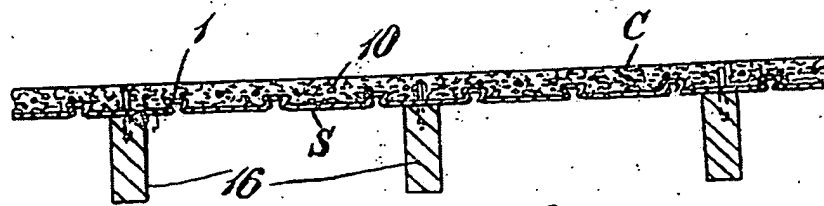
*Fig. 11.*



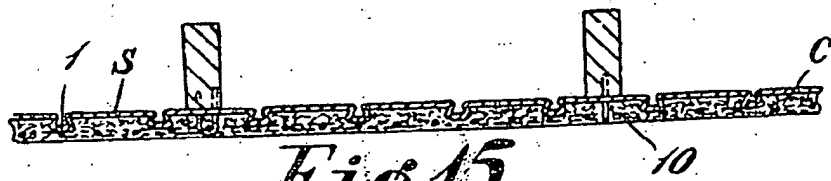
*Fig. 12.*



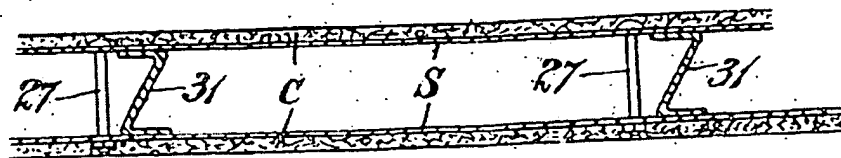
*Fig. 13.*



*Fig. 14.*



*Fig. 15.*



*Fig. 17.*